DATA SHEET

40GE QSFP+ Optics

The QSFP+ pluggable interface is an industry standard - Multisource Agreement (MSA) for pluggable 40 Gigabit Ethernet Optics.

HIGHLIGHTS

- The IEEE 802.3ba committee ratified the 40 Gigabit Ethernet standard and along with the general specification, defined a number of fiber optic interfaces. These standard interfaces attempted to satisfy a number of different objectives including support for MMF and SMF compatibility.

40G LR4 QSFP+

- 40GBASE-LR4 transceivers are most commonly deployed between data-center or IXP sites with single mode fiber

40G SR4 QSFP+

- 40GBASE-SR4 transceivers are used in data centers to interconnect two Ethernet switches with 8 fiber parallel multimode fiber OM3/OM4 cables

40G LR4 PARALLEL SINGLE MODE (PSM)

- 40G PSM transceivers are used to provide support for up to four 10Gb Ethernet connections on a QSFP+ port over single mode fiber at distances up to 10km.

40G LM4 QSFP+

- 40G LM4 transceivers provide 40Gb connections over a single pair of duplex OM3/OM4 MMF or SMF.

40G ER4 QSFP+

- 40G ER4 transceivers can be used to provide long distance 40Gb connections up to 40km.

40G BIDIRECTIONAL MMF QSFP+

- 40Gb BiDi transceivers support 40Gb connections over a single pair of MMF.

40G LC QSFP+

40G MPO QSFP+

Products

40G LR4 QSFP+

- 40GBASE-LR4 transceiver support with a link length up to 10 kilometers over 1310 nm single mode fiber, LC Connector

40G SR4 QSFP+

- 40GBASE-SR4 transceiver support with a link length up to 100 meters on OM3 and 150m on OM4 over 850 nm multimode fiber, 8 parallel fiber MPO Connector

40G LR4 PARALLEL SINGLE MODE (PSM)

- 40G PSM transceivers support up to 10 kilometers over single mode fiber using an 8 parallel fiber MPO interface. Each fiber pair can be broken out to a 10Gb Ethernet connection, compatible with up to four 10GBASE-LR interfaces. The MPO to 4 x LC single mode fiber patch cord can be used to breakout the 4 fiber pair of the MPO parallel connector to 4 separate fiber pairs.

40G LM4 QSFP+

- The LM4 QSFP+ module provides a 40-Gbps optical connection on a duplex single pair of fibers using single mode fiber or multimode fiber. LM4 supports links up to 1Km using SMF and up to 160m using MMF (OM4), or up to 140m using MMF (OM3).

40G ER4 QSFP+

- The ER4 QSFP+ module provides a 40-Gbps optical connection using LC optical connectors and can operate up to 40 km using single mode fiber.

40G BIDIRECTIONAL MMF QSFP+

- 40Gb BiDi transceivers support 40Gb connections up to 100m over a single pair of MMF (OM3/OM4). Breakout to 4 x 10Gb Ethernet is not supported.

	40G ER4 QSFP+	40G LR4 QSFP+	40G LR4 PSM QSFP+	40G LM4 QSFP+	40G SR4 QSFP+	40G BIDI QSFP+
Fiber Type	Single-Mode (SMF)	Single-Mode (SMF)	Single-Mode (SMF)	SMF and MMF	Multi-Mode (MMF)	Multi-Mode (MMF)
Connector Type	Duplex LC	Duplex LC	8 Fiber MPO APC	Duplex LC	8 Fiber MPO	Duplex LC
Launch Power	4.5 - -2.7dBm	2.3 - -7dBm	1.5 - -6dBm	4.3 - -7dBm	-7.3dBm	5 - -4dBm
Receiver Power Range	-4.5 - -21.2dBm	2.3 - -13.7dBm	2.3 - -12.7dBm	4.3 - -10dBm	-1 - -9.9dBm	5 - -7dBm
Center Wavelength	1271/1291/1311/1331nm	1271/1291/1311/1331nm	1310nm	1271/1291/1311/1331nm	850nm	850/900nm
Distance Range	40km (minimum of 9dB attenuation)	2m to 10km	2m to 10Km	1km SMF / 140m OM3 MMF / 160m OM4 MMF	100m OM3 / 150m OM4	100m OM3/OM4

Note: All Extreme Networks qualified QSFP+ plugables meet or exceed the IEEE 802.3ae 40 Gigabit Ethernet specification. The table above shows some QSFP+ parameters that may be useful for 40 Gigabit Ethernet deployments.

Transmission distances are provided as a nominal guide only. To determine achievable distances, refer to the device's optical specifications and to the specific characteristics of your fiber installation.

Physical Specifications

- Dimensions (HxWxD): 2.795x0.722x0.498 in 7.09x1.83x1.26 cm)
- Weight: 0.1 lb (45.35 g) unpackaged, 0.14 lb (67.47g) packaged
- Shipping box dimensions (HxWxD): 1.26x2.87x4.72 in(3.2x7.28x11.98 cm)

Environmental Conditions

OPERATIONAL

- Operating Temperature: 0° C to +70° C (32° F to 158° F)
- Operating Humidity: 10% to 93% non-condensing
- Altitude: 0 – 4000 meters (13,000 ft)
- Operational Shock: 30 m/s2 (3g), 11ms
- Operational Random Vibration: 5 – 500 Hz @ 1.5 Grms

TRANSPORTATION & STORAGE

- Temperature: -40° C to 70° C (-40° F to 158° F)
- Relative Humidity: 10% to 93%
- Shock: 180 m/s2 (18g), 6ms
- Random Vibration: 5 – 20 Hz @ 1.0 ASD w/-3dB/oct. from 20 – 200 Hz
- Drop: 42" (105cm)

Environmental Standards

- EN 300 019-2-3 v2.1.2 (2003-04), Stationary Use, Class 3.1e
- EN 300 019-2-2 v2.1.2 (1999-09), Public Transportation, Class 2.3
- EN 300 019-2-1 v2.1.2 (2000-09), Storage, Class 1.2
- RoHS 6 compliant
- China RoHS compliant
- WEEE Compliant

Safety Compliance

NORTH AMERICAN SAFETY OF ITE

- UL60950:2000 3rd edition of later, Recognized Component
- cUL to CSA 22.2#60950:2000 3rd Ed or later, Recognized Component

EUROPEAN SAFETY OF ITE

- EN60950-1:2001+ all available country deviations
- 2006/95/EC Low Voltage Directive (LVD)

LASER SAFETY

- EN60825-1:1994, A11:1996, A2:2001
- 21 CFR Subpart J, Class 1 Laser
- CDRH Letter of Approval

EMI/EMC Compliance

NORTH AMERICA EMC FOR ITE

- FCC CFR 47 Par t 15 Class A (U.S.A.)
- ICES-003 Class A (Canada)

EUROPEAN EMC STANDARDS

- EN 55022:2006, Class A
- EN 55024 A2:2003, Class A
- ETSI EN 300 386: v1.4.1 2008-04
- (EMC Telecommunications)
- 2004/108/EC EMC Directive

INTERNATIONAL EMC CERTIFICATIONS

- CISPR 22:2006 Ed 5.4, Class A (International Emissions)
- CISPR 24 A2:2003, Class A (International Immunity)
  - IEC/EN 61000-4-2:2001 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria B
  - IEC/EN 61000-4-3:2006 Radiated
  - Immunity 10V/m, 30MHz to 2GHz, Criteria A
  - IEC/EN 61000-4-4:2005 Transient Burst, 1kV, Criteria A
  - IEC/EN 61000-4-5 2005, Surge, 1kV L-L, 2kV L-G, Level 4, Criteria B
  - IEC/EN 61000-4-6:2007 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A
  - IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria A

Note: All QSFP+ modules meet the above standards when installed in Extreme Networks equipment.

Ordering Information

PART NO.	NAME	DESCRIPTION
10320	40GBASE-LR4 QSFP+	40GBASE-LR4 QSFP+, 1310nm, LC Connector, transmission length of up to 10km on SMF
10319	40GBASE-SR4 QSFP+	40GBASE-SR4 QSFP+, 850nm, MPO Connector, transmission length of up to 100m on OM3 or 150m on OM4 MMF
10326	40Gb LR4 PSM QSFP+	40Gb LR4 Parallel Single Mode (PSM) QSFP+, 1310nm, 10km SMF, MPO
10327	MPO to 4 x LC Patch Cord SMF 10m	MPO to 4 x LC duplex connectors, SMF fanout patch cord, 10m (for use with 10326 and 10Gb breakout)
10329	40Gb BiDi QSFP+	40Gb Bidirectional QSFP+, LC connector, 100m OM3/OM4 MMF
10334	40Gb LM4 QSFP+	40Gb LM4, 140m OM3 MMF, 1Km SMF, QSFP+, LC
10335	40Gb ER4 QSFP+	40Gb ER4, 40Km SMF, QSFP+, LC

Note: See the ExtremeXOS Hardware/Software Compatibility and Recommendation Matrices document for a full list of supported devices and ExtremeXOS release recommendations.